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Nebraska Tractor Tests

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1920

## Tractor Test 7: Case 20-40

Nebraska Tractor Test Laboratory

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**UNIVERSITY OF NEBRASKA**  
**AGRICULTURAL ENGINEERING DEPARTMENT**  
**UNIVERSITY FARM, LINCOLN**

Report of Official Tractor Test No. 7

Dates of test Apr. 10 to May 7, 1920  
 Name, model and rating of tractor Case 20-40  
 Serial No. Engine 22518 ~~Serial No. Chassis~~ Rated Speed 475 R.P.M.  
 Manufacturer J.I. Case Threshing Machine Co., Racine Wis.  
 Tractor equipment used K.W. Model HK magneto, Kingston Model E carburetor  
 Style and dimensions of wheel lugs Malleable 1  $\frac{11}{16}$  inches high 18 $\frac{1}{4}$  inches long,  
8 inch extension rims.

**Brake Horse Power Tests**

Horse Power Developed	Crank Shaft Speed R. P. M.	Length of Test Min.	Fuel Consumption			Water Consumption Gallons per Hour			Temperature *Cooling Fluid Deg. F.	Temperature of Atmosphere Deg. F.	Humidity %	Barometric Pressure Inches Mercury
			Kind of Fuel	Amount Used per Hour Gallons	Horse Power Hours per Gallon	In Radiator	In Fuel Mixture	Total				
RATED LOAD TEST												
40.29	482	120	Kero	7.124	5.66	0.04	5.50	5.54	163	64	67	28.3
	Belt	Slippage		2.25 %								
VARYING LOAD TEST *												
40.14	480	10	Kero									
40.48	467.5	"	"									
1.17	496	"	"									
10.49	494	"	"									
20.44	491	"	"									
31.21	491.5	"	"									
24.31	487	60	"	4.996	4.87	None	1.82	1.82	167	66	67	28.3
MAXIMUM LOAD TEST												
42.80	473	60	Kero	7.678	5.57	0.07	3.65	3.72	165	62	92	28.4
	Belt	Slippage		2.41 %								
HALF LOAD TEST												
20.57	494	60	Kero	4.644	4.43	0.24	1.60	1.84	169	72	67	28.3
	Belt	Slippage		1.69 %								

\*Taken in discharge line from engine.

Remarks The kerosene used in brake tests weighed 6.71 lbs. per gallon.

\* In the varying load test it was necessary to shut off the  
water feed to fuel mixture for 0, and  $\frac{1}{4}$  loads. The governor hunted  
at 0,  $\frac{1}{4}$  and  $\frac{1}{2}$  loads.

# Report of Official Tractor Test No. 7

## Drawbar Horse Power Tests

Horse Power Developed	Draw Bar Pull Pounds	Speed Miles per Hour	Crank Shaft Speed R. P. M.	** Slippage of Drive Wheels %	Fuel Consumption			Water Used per Hour Gallons	*Temperature of Cooling Fluid Deg. F.	Temperature of Atmosphere Deg. F.	Average Humidity %	Barometric Pressure Inches Mercury
					ind of Fuel Used	Amount Used per Hour Gallons	Horse Power Hours per Gallon					
RATED LOAD TEST. TEN HOURS ( 9 Hours 45 Minutes)												
21.48	3987	2.02	485	4.76	Kero	6.345	3.885	4.44	159.5	57	67	29.0
MAXIMUM LOAD TEST ( 1 st 163.2 Ft. , 2 nd 171.8 Ft. )												
24.66	5537	1.67	450	10.13	Kero	Not Recorded			154	64	58	28.7
22.71	3273	2.60	430	5.40	"	"	"		156	64	58	28.7

\*Taken in discharge line from engine.

Remarks The kerosene used in drawbar tests weighed 6.80 Lbs. per gallon.

\*\* For computing slippage, the circumference of the drive wheels was taken at the points of the lug

The rated load test and the first maximum test were made with the tractor in low gear. The second maximum test was made with the tractor in high gear.

The condition of the track was better than usual when these tests were made.

## Oil Consumption:

During the complete test consisting of about 40 hours running the following oil was used:

For the engine, 12  $\frac{3}{4}$  gallons of Mobiloil BB

For the transmission, 1  $\frac{1}{2}$  gallons of Used crank case oil.

Report of Official Tractor Test No. 7.

Miscellaneous Tests: None.

Repairs and Adjustments. Endurance:

The left crank bearing was tightened after 13 hours run.

The spark plug was replaced in the front cylinder after 15 hours run, and the spark plug was replaced in the rear cylinder after about 30 hours run. The plugs removed were still good but apparently were moist which caused the engine to miss fire when it was started up.

At the end of the test the tractor was apparently in good condition. There was no indication of undue wear in any part nor of any weakness which might require early repairs.

Brief Specifications Case 20-40 H.P. Tractor.

Engine: Two cylinder opposed, horizontal, Bore 8-3/4", stroke 9", rated speed 475 r.p.m.  
Chassis: Four wheel. rated speeds: low gear 2 mi. per hr., high gear 3 mi. per hr.  
Total weight 13780 lbs.

General Remarks:

In the advertising literature submitted with the application for test of this tractor we find the following statement regarding horsepower capacity: "It ---- develops a liberal reserve power over its rated horse power." We do not approve this statement for the reason that it is indefinite and therefore likely to be misleading. We also find in this advertising literature some statements and claims which cannot be directly compared with the results of this test as reported above. It is our opinion that none of these statements or claims are unreasonable or excessive.

We, the undersigned, certify that above is a true and correct report of official tractor test No. 7.

Claude K. Shedd  
Engineer-in-Charge

Oscar W. Sjogren  
E. E. Brachett  
John W. Harney  
Board of Tractor Test Engineers.